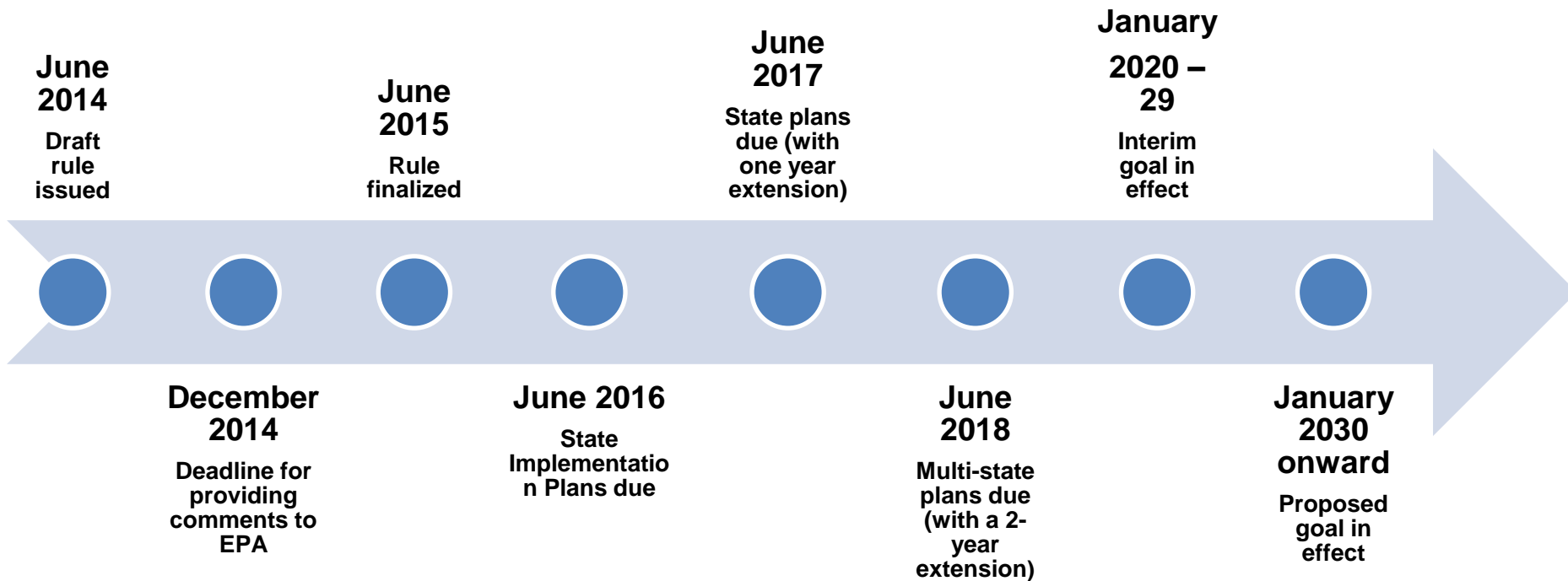
A large, light gray, stylized sun graphic is positioned on the left side of the slide. It consists of a semi-circle at the top with rays extending downwards, and a larger, more complex shape below it that resembles a sunburst or a stylized sun with rays extending outwards. The graphic is semi-transparent and serves as a background element for the text.

**Clean Power Plan:  
MISO Analysis Update  
ADEQ/APSC  
Stakeholder Meeting**

October 1, 2014

# The purpose of MISO's analysis...

...is to inform stakeholders of potential impacts on the generation fleet and load resulting from the EPA's proposal to reduce CO<sub>2</sub> emissions from existing electric generating units.



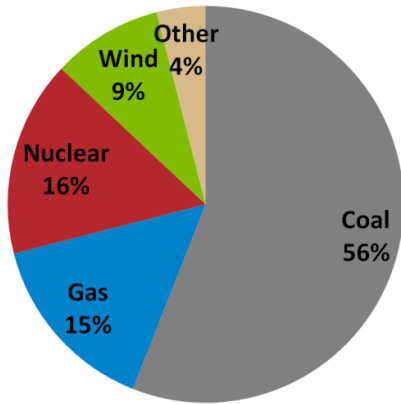
# Key Findings

- Compliance is expensive
  - ~\$90B net present value for Building Blocks
  - ~\$55B net present value for regional optimization
- Regional compliance is approximately 40% less expensive
  - \$38/ton (regional) vs \$57/ton (sub-regional) CO<sub>2</sub> emissions reduction
- Compliance timeline significantly challenges resource adequacy

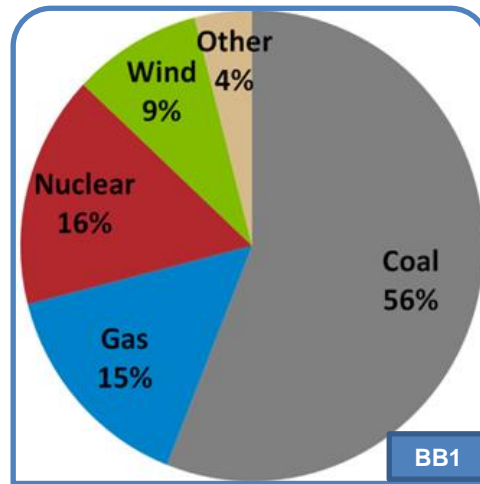
# Study objectives

Phase	Objectives
Phase 1	<p>Calculation of the compliance costs for regional (MISO footprint) and sub-regional (Local Resource Zones) CO<sub>2</sub> management</p> <ul style="list-style-type: none"><li data-bbox="484 529 1789 629">➤ Applying the Building Blocks as proposed in the EPA's draft rule using EPA's assumptions</li><li data-bbox="484 694 1692 793">➤ Applying a regional CO<sub>2</sub> constraint, i.e., a regional CO<sub>2</sub> reduction target</li></ul>
Phase 2	<p>Examination of the range of CO<sub>2</sub> emissions reductions, and associated costs, under various future policy and economic assumptions</p>

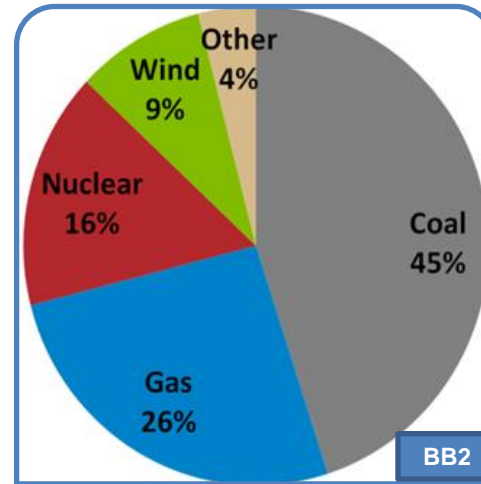
# MISO system: 2030 energy generation by fuel type



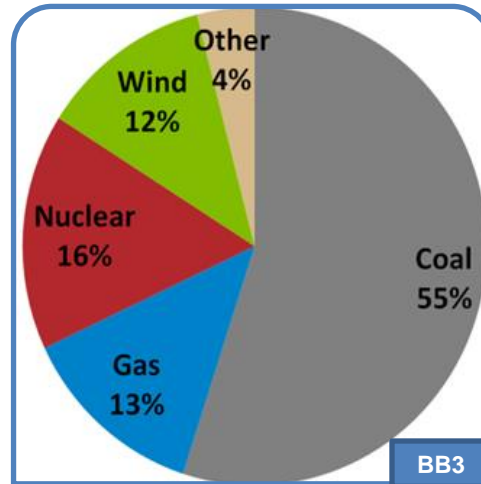
Reference Case



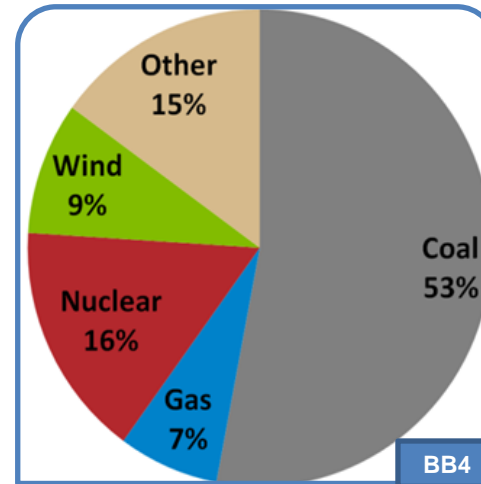
BB1



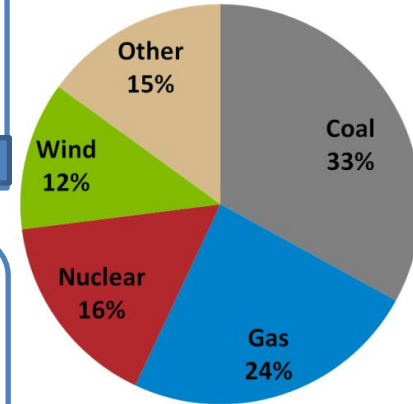
BB2



BB3



BB4



All Building Blocks

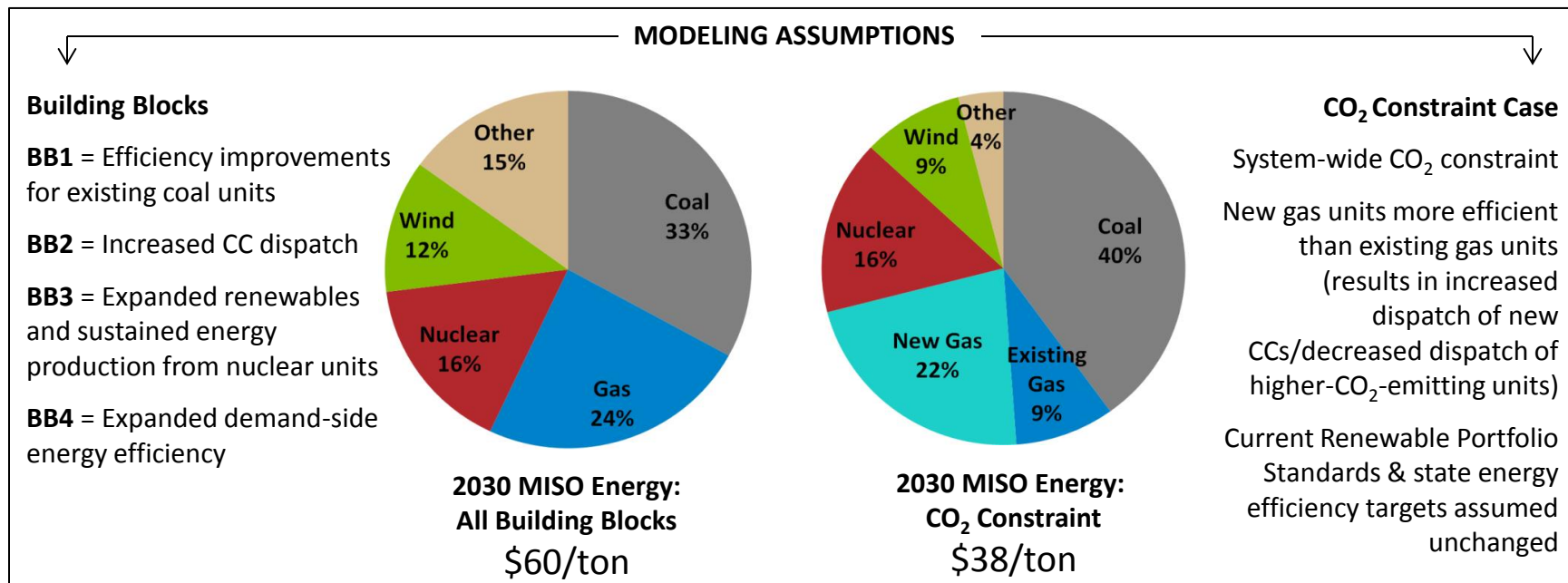
Energy production from new gas is less than 2.3% in all the scenarios.

"Other" category includes energy from biomass, hydro, demand response, energy efficiency and solar.

# Thinking outside the blocks

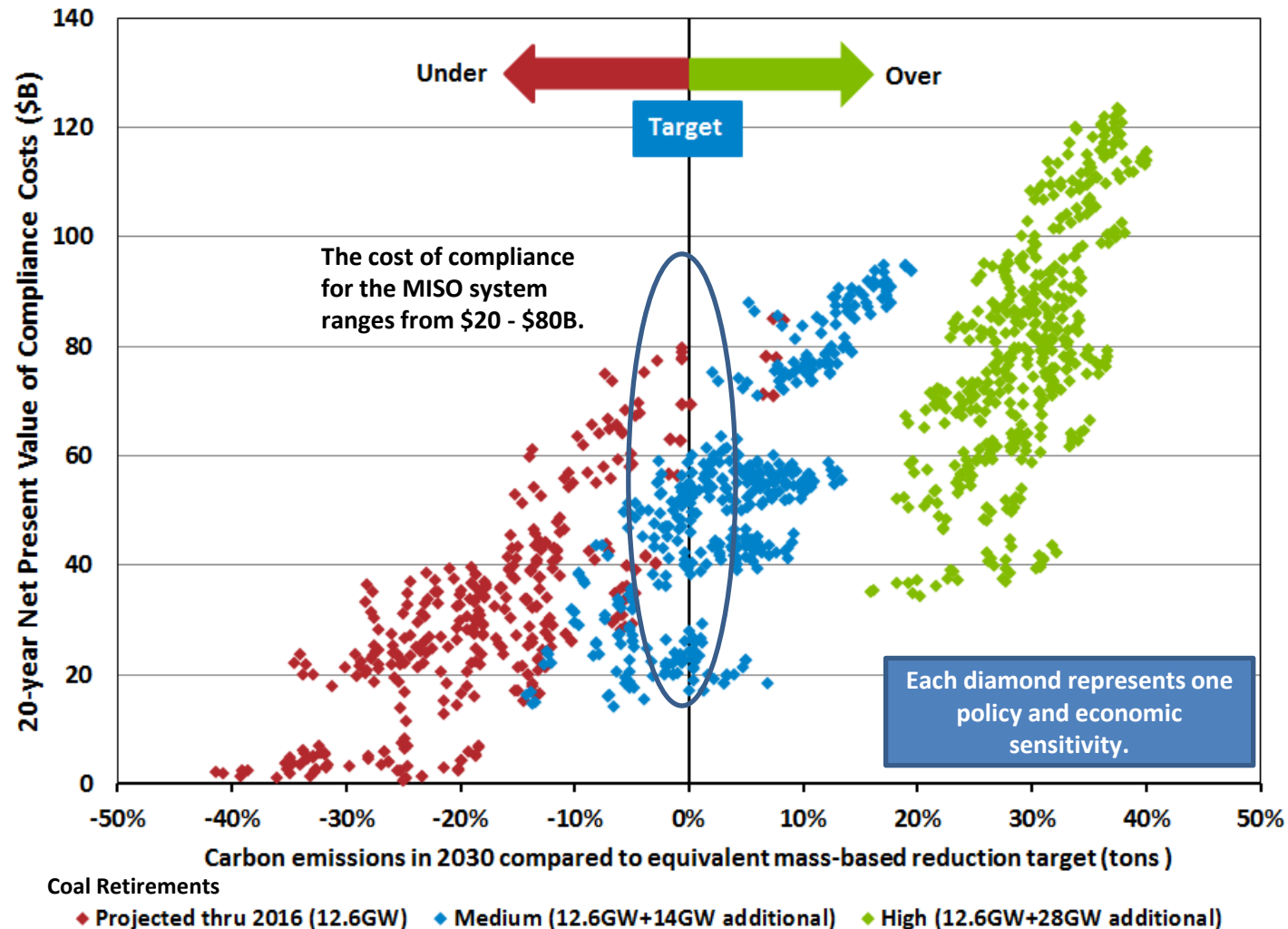
Alternative compliance options achieve the proposed level of CO<sub>2</sub> reduction at a lower cost than the EPA Building Blocks by approximately \$3.5B annually.

The difference in the “Other” category is due to modeling assumptions: EPA assumes 1.5% annual growth in energy efficiency as a % of energy sales; MISO assumes continuation of existing energy efficiency programs.

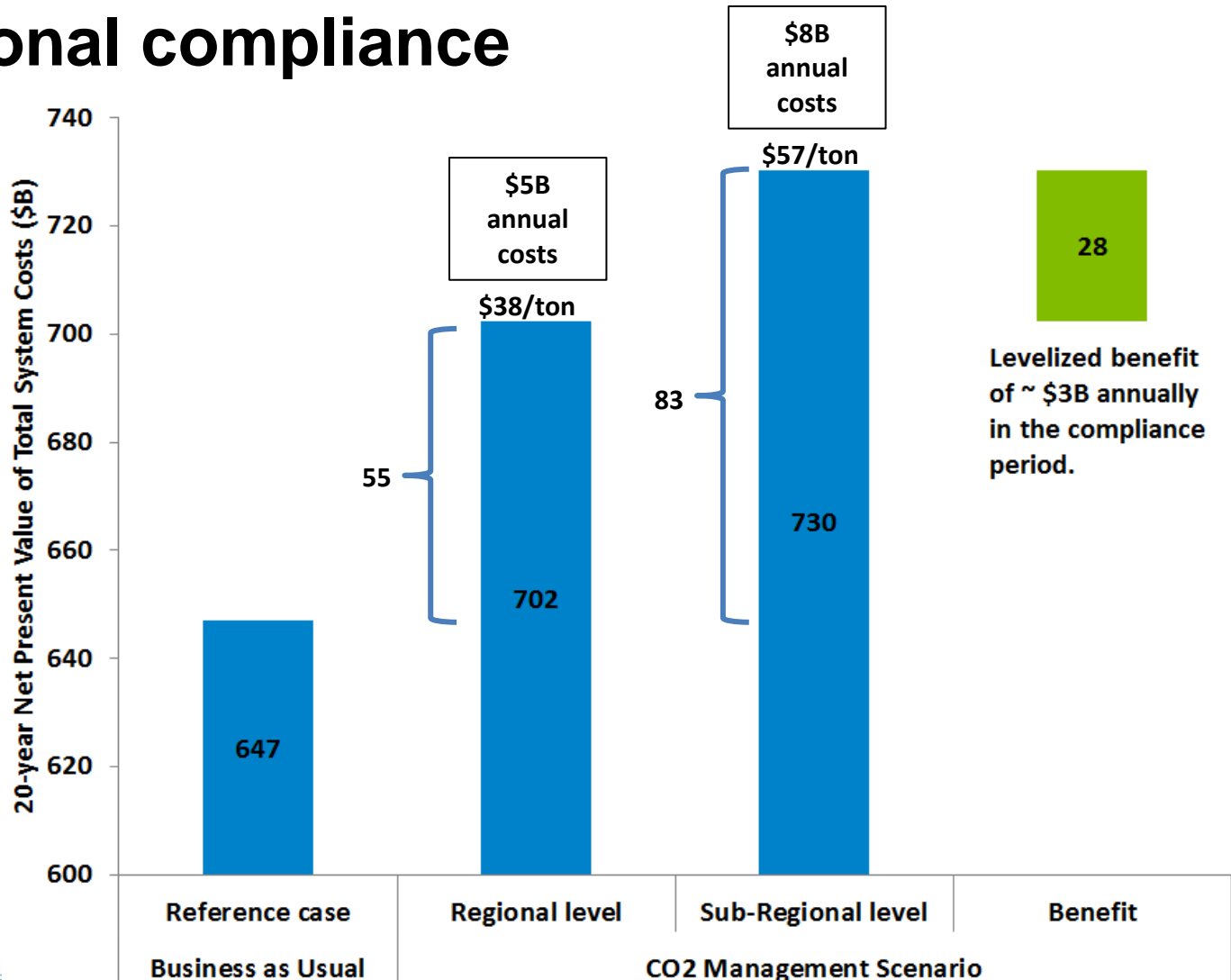


*In the reference scenario, energy production from new gas is less than 2.3%. “Other” category includes energy from biomass, hydro, demand response, energy efficiency and solar. The results shown for the CO<sub>2</sub> Constraint case are indicative. Further model optimization is required as shown in Phase 2 which indicates potential additional value from increased energy efficiency and coal retirements.*

# Lower cost compliance strategies would retire up to an additional 14GW of coal capacity

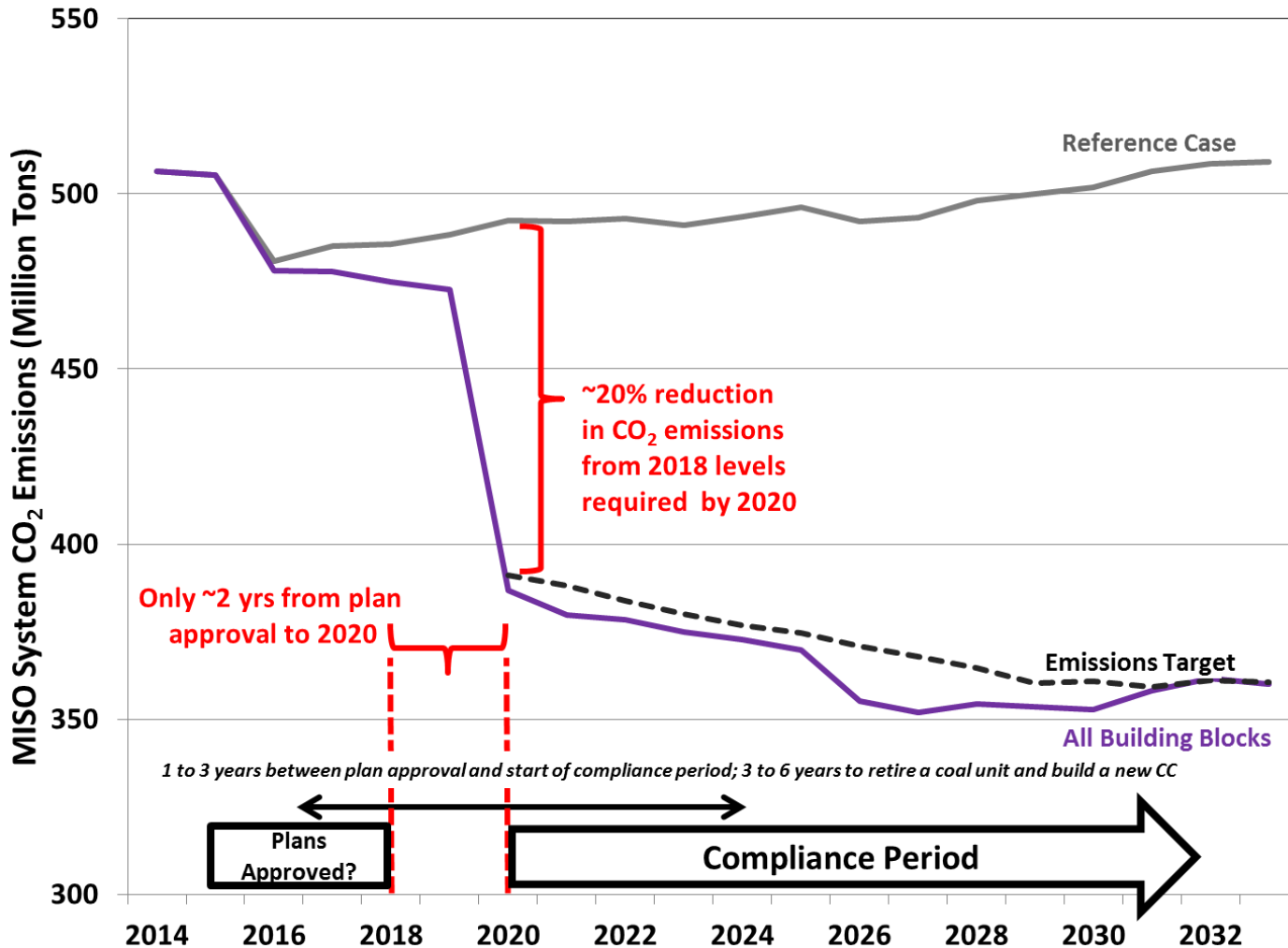


# Regional compliance options avoid approximately \$3B annually compared to sub-regional compliance





# Is there enough time to implement lower cost compliance strategies?



# Additional Information

- MISO's Planning Advisory Committee  
Presentation of Study Results
- <https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140917/20140917%20PAC%20Item%2002%20GHG%20Regulation%20Impact%20Analysis%20-%20Study%20Results.pdf>
- MISO One-Pager on Initial Study Results
- <https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140917/20140917%20PAC%20Item%2002%20MISO%20CO2%20Analysis%20One%20Pager.pdf>
- Contact: [thillman@misoenergy.org](mailto:thillman@misoenergy.org)